

## CLAIMS

### **We Claim:**

- 5 1. A method of producing an immunogenic composition comprising transforming a plant with a nucleotide construct expressing a recombinant viral immunogen in a plant,  
selecting those plants expressing said recombinant viral immunogen at a level such that upon oral administration of a composition comprising a plant-expressed recombinant viral  
10 immunogen to an animal, an immunogenic response to said viral immunogen is elicited, and producing from said plants said immunogenic composition.
- 15 2. The method of claim 1, wherein said immunogen is capable of generating an immunogenic response when the immunogen interacts with a mucosal membrane.
3. The method of claim 1, wherein said immunogen is from a transmissible gastroenteritis virus.
- 20 4. The method of claim 1 further comprising:  
selecting edible plant tissue expressing said immunogen at a level such that a composition comprising said immunogen induces an immunogenic response upon administration to an animal, wherein said level of immunogen correlates with expression levels of said immunogen in said tissue.
- 25 5. The method of claim 1, wherein said plant is a dicotyledonous plant.
6. The method of claim 1 further comprising the step of:  
introducing into said plant a nucleotide sequence designed for expression of said immunogen comprising one of more of the following features:  
30 a promoter sequence which preferentially targets expression to edible tissues of a plant;  
a 5' untranslated leader sequence  
an enhancer sequence.
- 35 7. The method of claim 1 wherein said plant is a monocot plant.

8. A method of producing an immunogenic composition comprising:  
introducing into a plant a nucleotide construct which causes expression of a recombinant viral immunogen preferentially in the edible tissues of said plant,

5 and

selecting those plants with expression in said tissue at a level such that upon oral administration of said tissue to an animal, an immunogenic response to said viral immunogen is observed, to form said immunogenic composition.

10 9. A method of producing an immunogenic composition comprising  
obtaining a nucleotide construct, said construct comprising:

a nucleotide sequence which encodes a recombinant viral immunogen and one or more of the following:

a promoter sequence which preferentially targets expression to edible tissues of a  
15 plant;

a 5' untranslated leader sequence

an enhancer sequence;

transforming a plant cell with said sequence so that expression of the recombinant viral immunogen is at a level such that upon oral administration of the plant an immunogenic  
20 response to said immunogen is observed, and

collecting plants with said expression level to form said immunogenic composition.

10. The method of claim 1, wherein said plant is an plant edible by an animal.

25 11. A method of eliciting an immunogenic response in an animal, the method comprising  
transforming a plant with a nucleotide construct expressing a recombinant viral immunogen  
in a plant,

selecting those plants expressing said recombinant viral immunogen at a level such that upon oral administration of a composition comprising said plant-expressed recombinant viral  
30 immunogen to an animal, an immunogenic response to said viral immunogen is elicited, and  
contacting said composition with said animal to elicit an immunogenic response in said animal.

12. The method of claim 11 wherein said plant is an edible plant.

13. The method of claim 11 wherein said plant is a monocotyledonous plant.

14. The method of claim 11 wherein tissue of said plant is orally administered to said animal.